

FIGURE 1



Gly Ser Gly Cys Arg Ser Leu Ser Leu Phe Arg Gly Ala Ser Tyr Leu Ile Ser  
 Gly Ala Ala Val Asp Leu Phe Arg Phe Ser Gly Val Leu Leu Ile Phe Phe Val  
 Ala Arg Gln Trp Met Ser Phe Ala Phe Pro Val Ser Trp Cys Phe Leu Ser Tyr  
 ---  
 ACG GGC GAC GGT GTA GCT CTT TCG CTT TCC TTG GCT GGT CGT CTT ATT TCT TAT  
 279 288 297 306 315 324  
 TGC CCG CTG CCA CAT CGA GAA AGC GAA AGG AAC CGA CCA GCA GAA TAA AGA ATA  
 ---  
 Cys Pro Leu Pro His Arg Glu Ser Glu Arg Asn Arg Pro Ala Glu \*\*\* Arg Ile  
 Ala Arg Cys His Ile Glu Lys Ala Lys Gly Thr Asp Gln Gln Asn Lys Glu Tyr  
 Pro Ala Ala Thr Ser Arg Lys Arg Lys Glu Pro Thr Ser Arg Ile Lys Asn Thr

Cys Tyr Leu Leu Gly Cys Val \*\*\* Arg Thr His Leu Glu Ala Ser Gly Pro Ser  
 Ala Thr Phe Phe Ala Val Tyr Lys Asp Leu Thr Ser Ser Arg Pro Val Leu Pro  
 Gln Leu Leu Ser Pro Trp Met Ser Ile Ser His Pro Ala Gly Arg Phe Trp Pro  
 ---  
 GAC GTC ATT TCT TCC GGT GTA TGA ATA GCT CAC ACC TCG AGG CGC CTT GGT CCC  
 333 342 351 360 369 378  
 CTG CAG TAA AGA AGG CCA CAT ACT TAT CGA GTG TGG AGC TCC GCG GAA CCA GGG  
 ---  
 Leu Gln \*\*\* Arg Arg Pro His Thr Tyr Arg Val Trp Ser Ser Ala Glu Pro Gly  
 Cys Ser Lys Glu Gly His Ile Leu Ile Glu Cys Gly Ala Pro Arg Asn Gln Gly  
 Ala Val Lys Lys Ala Thr Tyr Leu Ser Ser Val Glu Leu Arg Gly Thr Arg Gly

Ala Cys Arg Gly Thr \*\*\* Gln Gln Ser Tyr Gly Lys Pro Ser Pro Thr Lys Pro  
 Leu Ala Ala Val Gln Arg Ser Ser His Thr Gly Lys Gln Leu Arg Pro Arg Gln  
 Phe Arg Leu Ser Arg Asp Val Ala Thr Leu Val Arg Lys Ser Val Pro Asp Lys  
 ---  
 CTT CGC GTC GCT GGA CAG ATG ACG ACA CTC ATG GGA AAA CCT CTG CCC CAG AAA  
 387 396 405 414 423 432  
 GAA GCG CAG CGA CCT GTC TAC TGC TGT GAG TAC CCT TTT GGA GAC GGG GTC TTT  
 ---  
 Glu Ala Gln Arg Pro Val Tyr Cys Cys Glu Tyr Pro Phe Gly Asp Gly Val Phe  
 Lys Arg Ser Asp Leu Ser Thr Ala Val Ser Thr Leu Leu Glu Thr Gly Ser Leu  
 Ser Ala Ala Thr Cys Leu Leu Leu \*\*\* Val Pro Phe Trp Arg Arg Gly Leu Trp

Ser Gln Leu Arg Ala Thr Glu Gln Leu Thr His Ser Phe Asn Gly Arg Ala Pro  
 His Ser Tyr Gly Leu Leu Lys Arg Tyr Arg Ile His Ser Ile Glu Ala Pro Gln  
 Thr Val Thr Ala Ser Cys Asn Gly Thr Val Tyr Thr Leu Phe Lys Arg Pro Ser  
 ---  
 CCA CTG ACA TCG GCT CGT CAA AGG ACA TTG CAT ACA CTC TTT AAA GGC GCC CGA  
 441 450 459 468 477 486  
 GGT GAC TGT AGC CGA GCA GTT TCC TGT AAC GTA TGT GAG AAA TTT CCG CGG GCT  
 ---  
 Gly Asp Cys Ser Arg Ala Val Ser Cys Asn Val Cys Glu Lys Phe Pro Arg Ala  
 Val Thr Val Ala Glu Gln Phe Pro Val Thr Tyr Val Arg Asn Phe Arg Gly Leu  
 \*\*\* Leu \*\*\* Pro Ser Ser Phe Leu \*\*\* Arg Met \*\*\* Glu Ile Ser Ala Gly Trp

Gln Val Lys Ser Leu Ser Arg Ser Ser Ala Ala Ala His Asn Ser Ser Leu Gln  
 Ser Phe Lys Gln Phe His Ala Pro Leu His Leu Leu Thr Ile Pro Leu Cys Ser  
 Ala Ser Ser Lys Phe Thr Leu Pro Phe Ile Cys Cys Arg Ser Gln Phe Val Ala  
 ---  
 CCG ACT TGA AAA CTT TCA CTC GCC CTT CTA CGT CGT CGC ACT AAC CTT CTG TCG  
 495 504 513 522 531 540  
 GGC TGA ACT TTT GAA AGT GAG CGG GAA GAT GCA GCA GCG TGA TTG GAA GAC AGC  
 ---  
 Gly \*\*\* Thr Phe Glu Ser Glu Arg Glu Asp Ala Ala Ala \*\*\* Leu Glu Asp Ser  
 Ala Glu Leu Leu Lys Val Ser Gly Lys Met Gln Gln Arg Asp Trp Lys Thr Ala  
 Leu Asn Phe \*\*\* Lys \*\*\* Ala Gly Arg Cys Ser Ser Val Ile Gly Arg Gln Leu

FIGURE 2 (continuation 1)



Gly Pro Ile Thr Ser Arg Leu Gln Gln Gly Leu Gln Leu Leu Glu Arg Asp Ser  
 Gly Leu Phe Pro Val Gly \*\*\* Ser Ser Asp Trp Ser Tyr Phe Ser Glu Ile Pro  
 Gly Trp Ser His Tyr Glu Glu Val Ala Thr Gly Ala Thr Ser Ala Arg \*\*\* Arg  
 ---  
 GGG GGT CCT TAC CAT GAG GAG TTG ACG ACA GGG TCG ACA TCT TCG AGA GAT AGC  
 819 828 837 846 855 864  
 CCC CCA GGA ATG GTA CTC CTC AAC TGC TGT CCC AGC TGT AGA AGC TCT CTA TCG  
 ---  
 Pro Pro Gly Met Val Leu Leu Asn Cys Cys Pro Ser Cys Arg Ser Ser Leu Ser  
 Pro Gln Glu Trp Tyr Ser Ser Thr Ala Val Pro Ala Val Gly Ala Leu Tyr Arg  
 Pro Arg Asn Gly Thr Pro Gln Leu Leu Ser Gln Leu \*\*\* Lys Leu Ser Ile Gly

Ser \*\*\* \*\*\* Lys Ala Ile Lys Ser Ser Gln Gln Leu Val Ile Trp Pro Pro Val  
 Pro Asn Ser Ser Gln Leu Lys Pro Leu Ser Ser Ser Phe Leu Gly Arg Leu Tyr  
 Leu Ile Val Val Lys Cys Asn Gln Phe Val Ala Pro Ser Cys Asp Val Ser Thr  
 ---  
 CTC CTA ATG ATG AAA CGT TAA AAC CTT CTG ACG ACC TCT TGT TAG GTG CCT CCA  
 873 882 891 900 909 918  
 GAG GAT TAC TAC TTT GCA ATT TTG GAA GAC TGC TGG AGA ACA ATC CAC GGA GGT  
 ---  
 Glu Asp Tyr Tyr Phe Ala Ile Leu Glu Asp Cys Trp Arg Thr Ile His Gly Gly  
 Arg Ile Thr Thr Leu Gln Phe Trp Lys Thr Ala Gly Glu Gln Ser Thr Glu Val  
 Gly Leu Leu Leu Cys Asn Phe Gly Arg Leu Leu Glu Asn Asn Pro Arg Arg Tyr

Arg Leu Gly Ile Gln Leu Leu Pro Gly Val Arg His Gly Lys Gly Met Tyr Phe  
 Gly Phe Ala Ser Lys Phe Cys His Val Trp Gly Thr Gly Lys Glu Trp Ile Phe  
 Gly Ser Pro Arg Asn Ser Ala Thr Ser Gly Gly Gln Ala Arg Lys Gly Tyr Leu  
 ---  
 TGG GCT TCC GGC TAA ACT TCG TCA CCT GGG TGG GAC ACG GGA AAA GGG TAT ATT  
 927 936 945 954 963 972  
 ACC CGA AGG CCG ATT TGA AGC AGT GGA CCC ACC CTG TGC CCT TTT CCC ATA TAA  
 ---  
 Thr Arg Arg Pro Ile \*\*\* Ser Ser Gly Pro Thr Leu Cys Pro Phe Pro Ile \*\*\*  
 Pro Glu Gly Arg Phe Glu Ala Val Asp Pro Pro Cys Ala Leu Phe Pro Tyr Lys  
 Pro Lys Ala Asp Leu Lys Gln Trp Thr His Pro Val Pro Phe Ser His Ile Lys

Leu Asn Ser Leu Arg Lys Gln \*\*\* \*\*\* Met Thr Ile Thr Lys Ile Lys Ile \*\*\*  
 Tyr Ile Val Ser Asp Lys Lys Asn Asp Cys Arg Leu Pro Lys \*\*\* Lys \*\*\* Glu  
 Ile Phe \*\*\* Gln Thr Lys Lys Thr Ile Val Asp Tyr His Asn Lys Asn Lys Asn  
 ---  
 TTA TTT AAT GAC TCA GAA AAA ACA ATA GTG TAG CAT TAC CAA AAA TAA AAA TAA  
 981 990 999 1008 1017 1026  
 AAT AAA TTA CTG AGT CTT TTT TGT TAT CAC ATC GTA ATG GTT TTT ATT TTT ATT  
 ---  
 Asn Lys Leu Leu Ser Leu Phe Cys Tyr His Ile Val Met Val Phe Ile Phe Ile  
 Ile Asn Tyr \*\*\* Val Phe Phe Val Ile Thr Ser \*\*\* Trp Phe Leu Phe Leu Phe  
 \*\*\* Ile Thr Glu Ser Phe Leu Leu Ser His Arg Asn Gly Phe Tyr Phe Tyr Ser

Lys Ser Pro Arg Glu Pro Tyr Ile Arg Gln Ile Thr Cys Leu Tyr Asp Val Lys  
 Asn Leu Pro Asp Lys Leu Ile Phe Glu Arg Phe Gln Val Tyr Ile Thr Leu Arg  
 Met \*\*\* Leu Thr Lys \*\*\* Ser Leu Asn Glu Ser Asn Tyr Met Phe Leu \*\*\* Gly  
 ---  
 GTA AAT CTC CCA GAA AGT CCT ATT TAA GAG ACT TAA CAT GTA TTT ATC AGT TGG  
 1035 1044 1053 1062 1071 1080  
 CAT TTA GAG GGT CTT TCA GGA TAA ATT CTC TGA ATT GTA CAT AAA TAG TCA ACC  
 ---  
 His Leu Glu Gly Leu Ser Gly \*\*\* Ile Leu \*\*\* Ile Val His Lys \*\*\* Ser Thr  
 Ile \*\*\* Arg Val Phe Gln Asp Lys Phe Ser Glu Leu Tyr Ile Asn Ser Gln Pro  
 Phe Arg Gly Ser Phe Arg Ile Asn Ser Leu Asn Cys Thr \*\*\* Ile Val Asn Leu

FIGURE 2 (continuation 3)

Gly Cys Leu Lys Pro Ser His Asn Cys Lys Pro Ala Cys Leu Gly Pro Arg His  
Val Val Tyr Asn Gln Ala Thr Thr Ala Asn Gln Leu Ala Tyr Gly Leu Gly Thr  
\*\*\* Trp Met Ile Lys Pro Gln Pro Gln Met Lys Ser Arg Met Ala Trp Ala Gln  
---  
AAT GGT GTA TTA AAA CCC GAC ACC AAC GTA AAA CCT CGC GTA TCG GGT CCG GAC  
1089 1098 1107 1116 1125 1134  
TTA CCA CAT AAT TTT GGG CTG TGG TTG CAT TTT GGA GCG CAT AGC CCA GGC CTG  
---  
Leu Pro His Asn Phe Gly Leu Trp Leu His Phe Gly Ala His Ser Pro Gly Leu  
Tyr His Ile Ile Leu Gly Cys Gly Cys Ile Leu Glu Arg Ile Ala Gln Ala Cys  
Thr Thr \*\*\* Phe Trp Ala Val Val Ala Phe Trp Ser Ala \*\*\* Pro Arg Pro Val

Ala Arg Cys Gln His Pro Tyr Lys Phe Pro Ala Val Ala Pro Lys Lys \*\*\*  
His Glu Val Asn Thr His Thr Asn Leu His Leu Trp Leu Gln Asn Arg Lys Asn  
Thr Ser Ser Met Pro Thr Pro Ile \*\*\* Ile Ser Gly Cys Ser Thr Glu Lys Ile  
---  
ACA CGA GCT GTA ACC ACA CCC ATA AAT TTA CCT CGG TGT CGA CCA AAG AAA ATA  
1143 1152 1161 1170 1179 1188  
TGT GCT CGA CAT TGG TGT GGG TAT TTA AAT GGA GCC ACA GCT GGT TTC TTT TAT  
---  
Cys Ala Arg His Trp Cys Gly Tyr Leu Asn Gly Ala Thr Ala Gly Phe Phe Tyr  
Val Leu Asp Ile Gly Val Gly Ile \*\*\* Met Glu Pro Gln Leu Val Ser Phe Ile  
Cys Ser Thr Leu Val Trp Val Phe Lys Trp Ser His Ser Trp Phe Leu Leu Leu

Lys Ala Pro Val Leu \*\*\* Asn Asn Pro Arg Ala Arg Thr Gln Pro His Leu Val  
Asn Pro Gln Phe Trp Asp Ile Thr Gln Asp Leu Glu Pro Lys Pro Thr Phe Tyr  
Ile Gln Ser Ser Gly Ile Leu Gln Lys Thr \*\*\* Ser Gln Asn Pro Pro Ser Thr  
---  
ATA AAC CGA CCT TGG TTA GTT AAC AAA CCA GAT CGA GAC CAA ACC CCC ACT TCA  
1197 1206 1215 1224 1233 1242  
TAT TTG GCT GGA ACC AAT CAA TTG TTT GGT CTA GCT CTG GTT TGG GGG TGA AGT  
---  
Tyr Leu Ala Gly Thr Asn Gln Leu Phe Gly Leu Ala Leu Val Trp Gly \*\*\* Ser  
Ile Trp Leu Glu Pro Ile Asn Cys Leu Val \*\*\* Leu Trp Phe Gly Gly Glu Val  
Phe Gly Trp Asn Gln Ser Ile Val Trp Ser Ser Ser Gly Leu Gly Val Lys Tyr

Gln Leu Pro Leu Tyr Leu Ala Ala Lys His His Pro Pro Leu Leu Leu \*\*\* Tyr  
Arg Ser His Tyr Thr Phe Pro Gln Arg Ile Thr His Arg Ser Ser Tyr Asn Ile  
Gly Pro Thr Thr Pro Leu Pro Ser Gly \*\*\* Pro Thr Ala Pro Pro Thr Thr Leu  
---  
TGG ACC TCA CCA TCC ATT TCC CGA CGG AAT ACC ACA CCG CCC TCC TCA TCA ATT  
1251 1260 1269 1278 1287 1296  
ACC TGG AGT GGT AGG TAA AGG GCT GCC TTA TGG TGT GGC GGG AGG AGT AGT TAA  
---  
Thr Trp Ser Gly Arg \*\*\* Arg Ala Ala Leu Trp Cys Gly Gly Arg Ser Ser \*\*\*  
Pro Gly Val Val Gly Lys Gly Leu Pro Tyr Gly Val Ala Gly Gly Val Val Asn  
Leu Glu Trp \*\*\* Val Lys Gly Cys Leu Met Val Trp Arg Glu Glu \*\*\* Leu Ile

Leu Pro \*\*\* Leu Gly Leu Gln His Leu Pro Asn Cys Leu Gln Cys Gly Leu Tyr  
Tyr Pro Asp Tyr Ala Leu Asn Thr Ser Pro Thr Val Phe Asn Ala Asp Leu Ile  
Ile Pro Thr Met Pro Trp Thr Pro Pro Pro Pro \*\*\* Leu Thr Pro Met Trp Ser  
---  
ATA TCC CCA GTA TCC GGT TCA ACC ACC TCC CCC AAT GTT TCA ACC GTA GGT TCT  
1305 1314 1323 1332 1341 1350  
TAT AGG GGT CAT AGG CCA AGT TGG TGG AGG GGG TTA CAA AGT TGG CAT CCA AGA  
---  
Tyr Arg Gly His Arg Pro Ser Trp Trp Arg Gly Leu Gln Ser Trp His Pro Arg  
Ile Gly Val Ile Gly Gln Val Gly Gly Gly Gly Tyr Lys Val Gly Ile Gln Asp  
\*\*\* Gly Ser \*\*\* Ala Lys Leu Val Glu Gly Val Thr Lys Leu Ala Ser Lys Ile

FIGURE 2 (continuation 4)

Cys Cys His Val Trp Cys Arg Lys Ser \*\*\* Leu His His Pro Arg Gln Pro Leu  
 Val Val Thr Ser Gly Val Gly Arg Gln Asn Ser Thr Ile Pro Asp Arg Pro Tyr  
 Leu Leu Leu Pro Gly Leu Val Glu Lys Ile Leu Pro Ser Pro Thr Glu Pro Thr  
 ---  
 ATT GTT GTC ACC TGG GTT GTG GAG AAA CTA ATC TCC ACT ACC CCA GAG ACC CCA  
 1359 1368 1377 1386 1395 1404  
 TAA CAA CAG TGG ACC CAA CAC CTC TTT GAT TAG AGG TGA TGG GGT CTC TGG GGT  
 ---  
 \*\*\* Gln Gln Trp Thr Gln His Leu Phe Asp \*\*\* Arg \*\*\* Trp Gly Leu Trp Gly  
 Asn Asn Ser Gly Pro Asn Thr Ser Leu Ile Arg Gly Asp Gly Val Ser Gly Val  
 Thr Thr Val Asp Pro Thr Pro Leu \*\*\* Leu Glu Val Met Gly Ser Leu Gly \*\*\*

Ile \*\*\* Ile \*\*\* Gly Lys \*\*\* Tyr Pro Leu Ile Pro Phe Thr Pro Thr Pro Pro  
 Phe Glu Tyr Lys Ala Lys Arg Ile Arg Tyr Tyr Gln Phe Pro Leu Pro Leu Pro  
 Phe Asn Met Asn Leu Arg Glu Leu Val Thr Thr Asn Ser Leu Tyr Pro Tyr Pro  
 ---  
 TTT TAA GTA TAA ATC GGA AAG ATT ATG CCA TCA TAA CCT TTC CAT CCC CAT CCC  
 1413 1422 1431 1440 1449 1458  
 AAA ATT CAT ATT TAG CCT TTC TAA TAC GGT AGT ATT GGA AAG GTA GGG GTA GGG  
 ---  
 Lys Ile His Ile \*\*\* Pro Phe \*\*\* Tyr Gly Ser Ile Gly Lys Val Gly Val Gly  
 Lys Phe Ile Phe Ser Leu Ser Asn Thr Val Val Leu Glu Arg \*\*\* Gly \*\*\* Gly  
 Asn Ser Tyr Leu Ala Phe Leu Ile Arg \*\*\* Tyr Trp Lys Gly Arg Gly Arg Gly

Gln His Arg Arg Leu Pro Pro Pro Val Pro Arg His Gln Ile Glu Ala Arg \*\*\*  
 Asn Thr Gly Gly Ser Pro Pro Leu Phe Gln Gly Ile Asn Phe Arg Leu Glu Asn  
 Thr Pro Ala Ala Gln Pro Pro Ser Ser Ser Ala Ser Thr Ser Asp \*\*\* Ser Thr  
 ---  
 CCA ACC ACG GCG GAC TCC CCC CCT CCT TGA CCG GCT ACA ACT TAG AGT CGA GCA  
 1467 1476 1485 1494 1503 1512  
 GGT TGG TGC CGC CTG AGG GGG GGA GGA ACT GGC CGA TGT TGA ATC TCA GCT CGT  
 ---  
 Gly Trp Cys Arg Leu Arg Gly Gly Gly Thr Gly Arg Cys \*\*\* Ile Ser Ala Arg  
 Val Gly Ala Ala \*\*\* Gly Gly Glu Glu Leu Ala Asp Val Glu Ser Gln Leu Val  
 Leu Val Pro Pro Glu Gly Gly Arg Asn Trp Pro Met Leu Asn Leu Ser Ser Leu

Cys Glu Leu Ile Ala Ala Leu Thr Arg Arg Lys His His Thr Cys Ile Arg \*\*\*  
 Val Asn Trp Ser Pro Gln Ser His Gly Gly Arg Ile Thr Leu Val Phe Glu Arg  
 Leu Met Gly Leu His Ser Arg Thr Asp Glu Glu \*\*\* Pro Ser Tyr Leu Asn Glu  
 ---  
 ATT GTA AGG TTC TAC CGA CGC TCA CAG GAG GAG AAT ACC ACT CAT GTT TAA GAG  
 1521 1530 1539 1548 1557 1566  
 TAA CAT TCC AAG ATG GCT GCG AGT GTC CTC CTC TTA TGG TGA GTA CAA ATT CTC  
 ---  
 \*\*\* His Ser Lys Met Ala Ala Ser Val Leu Leu Leu Trp \*\*\* Val Gln Ile Leu  
 Asn Ile Pro Arg Trp Leu Arg Val Ser Ser Ser Tyr Gly Glu Tyr Lys Phe Ser  
 Thr Phe Gln Asp Gly Cys Glu Cys Pro Pro Leu Met Val Ser Thr Asn Ser Leu

Phe Pro Pro Phe Gln Leu Tyr Gly Asp Lys Pro Ala Met Gln Leu Pro Lys Gln  
 Ser Leu Arg Ser Asn Phe Ile Gly Thr Lys Arg Arg Trp Arg Tyr Arg Asn Arg  
 Leu Phe Ala Pro Ile Ser Ser Val Arg Arg Glu Ala Gly Asp Thr Val Thr Glu  
 ---  
 ATC TTT CCG CCC TTA ACT TCT ATG GGC AGA AAG CCG CGG TAG ACA TTG CCA AAG  
 1575 1584 1593 1602 1611 1620  
 TAG AAA GGC GGG AAT TGA AGA TAC CCG TCT TTC GGC GCC ATC TGT AAC GGT TTC  
 ---  
 \*\*\* Lys Gly Gly Asn \*\*\* Arg Tyr Pro Ser Phe Gly Ala Ile Cys Asn Gly Phe  
 Arg Lys Ala Gly Ile Glu Asp Thr Arg Leu Ser Ala Pro Ser Val Thr Val Ser  
 Glu Arg Arg Glu Leu Lys Ile Pro Val Phe Arg Arg His Leu \*\*\* Arg Phe Leu

FIGURE 2 (continuation 5)

Leu Arg Pro Thr Gly Phe Ile Thr Lys Glu Pro Pro His Lys Trp Ser Pro Gln  
 Phe Ala Pro His Val Leu Tyr Pro Arg Arg Arg Leu Ile Asn Gly Leu His Ser  
 Ser Pro Pro Thr Tyr Trp Ile His Asp Glu Gly Ser Ser Thr Glu Leu Ile Ala  
 ---  
 ACT TCC GCC CCA CAT GGT TTA TAC CAG AAG AGG CCT CCT ACA AAG GTT CTA CCG  
 1629 1638 1647 1656 1665 1674  
 TGA AGG CGG GGT GTA CCA AAT ATG GTC TTC TCC GGA GGA TGT TTC CAA GAT GGC  
 ---  
 \*\*\* Arg Arg Gly Val Pro Asn Met Val Phe Ser Gly Gly Cys Phe Gln Asp Gly  
 Glu Gly Gly Val Tyr Gln Ile Trp Ser Ser Pro Glu Asp Val Ser Lys Met Ala  
 Lys Ala Gly Cys Thr Lys Tyr Gly Leu Leu Arg Arg Met Phe Pro Arg Trp Leu  
  
 Pro Pro Pro Asp Thr Lys Gln Pro Leu Ala Glu Lys Ala Val Asp Asp \*\*\* Leu  
 Arg Pro Arg Thr Arg Arg Arg Arg Tyr Arg Arg Arg Pro Trp Thr Met Arg Tyr  
 Ala Pro Ala Pro Gly Asp Glu Ala Thr Val Gly Gly Gln Gly Arg \*\*\* Gly Ile  
 ---  
 ACG CCC CCG CCC AGG CAG AAG ACG CCA TTG CGG AGG AAC CGG TGC AGT AGG ATA  
 1683 1692 1701 1710 1719 1728  
 TGC GGG GGC GGG TCC GTC TTC TCC GGT AAC GCC TCC TTG GCC ACG TCA TCC TAT  
 ---  
 Cys Gly Gly Gly Ser Val Phe Cys Gly Asn Ala Ser Leu Ala Thr Ser Ser Tyr  
 Ala Gly Ala Gly Pro Ser Ser Ala Val Thr Pro Pro Trp Pro Arg His Pro Ile  
 Arg Gly Arg Val Arg Leu Leu Arg \*\*\* Arg Leu Leu Gly His Val Ile Leu \*\*\*  
  
 Leu Ser Leu Leu Ala Ser Ser Tyr Tyr  
 Phe His Phe Phe His Ala Ala Thr Thr Asn  
 Phe Thr Phe Ser Thr Arg Gln Gln Leu Ile  
 ---  
 TTT TCA CTT TCT TCA CGC GAC GAC ATC ATA A 5'  
 1737 1746 1755  
 AAA AGT GAA AGA AGT GCG CTG CTG TAG TAT T 3'  
 ---  
 Lys Ser Glu Arg Ser Ala Leu Leu \*\*\* Tyr  
 Lys Val Lys Glu Val Arg Cys Cys Ser Ile  
 Lys \*\*\* Lys Lys Cys Ala Ala Val Val

FIGURE 2 (continuation 6)



		10	20	30	40	50	
circopormank	1	ACCAGCGCAC	TCGGCAGCG	GCAGCACCTC	GGCAGCGTCA	GTGAAATGC	50
circopormeeh	1	ACCAGCGCAC	TCGGCAGCG	GCAGCACCTC	GGCAGCGTCA	GTGAAATGC	50
circopordfp	1	ACCAGCGCAC	TCGGCAGCG	GCAGCACCTC	GGCAGCGTCA	GTGAAATGC	50
		60	70	80	90	100	
circopormank	51	CAAGCAAGAA	AAGCGGCCCG	CAACCCCAT	AGAGGTGGGT	TTCCACCCTT	100
circopormeeh	51	CAAGCAAGAA	AAGCGGCCCG	CAACCCCAT	AGAGGTGGGT	TTCCACCCTT	100
circopordfp	51	CAAGCAAGAA	AAGCGGCCCG	CAACCCCAT	AGAGGTGGGT	TTCCACCCTT	100
		110	120	130	140	150	
circopormank	101	AATAATCCTT	CCGAGGAGGA	GAAAAACAAA	TACGGGAGC	TTCCATCTC	150
circopormeeh	101	AATAATCCTT	CCGAGGAGGA	GAAAAACAAA	TACGGGAGC	TTCCATCTC	150
circopordfp	101	AATAATCCTT	CCGAGGAGGA	GAAAAACAAA	TACGGGAGC	TTCCATCTC	150
		160	170	180	190	200	
circopormank	151	CTTTTTGAT	TATTTTGT	CGGAGAGGA	GGTTTGGAA	GAGGGTAGAA	200
circopormeeh	151	CTTTTTGAT	TATTTTGT	CGGAGAGGA	GGTTTGGAA	GAGGGTAGAA	200
circopordfp	151	CTTTTTGAT	TATTTTGT	CGGAGAGGA	GGTTTGGAA	GAGGGTAGAA	200
		210	220	230	240	250	
circopormank	201	CTCTCACCT	CCAGGGGTTT	GCAATTTTG	TAAGAAGCA	SACTTTTAAC	250
circopormeeh	201	CTCTCACCT	CCAGGGGTTT	GCAATTTTG	TAAGAAGCA	SACTTTTAAC	250
circopordfp	201	CTCTCACCT	CCAGGGGTTT	GCAATTTTG	TAAGAAGCA	SACTTTTAAC	250
		260	270	280	290	300	
circopormank	251	AAGGTGAAGT	GGTATTTTGG	CGCCCGCTGC	CACATCGAGA	AAGCGAAAGG	300
circopormeeh	251	AAGGTGAAGT	GGTATTTTGG	CGCCCGCTGC	CACATCGAGA	AAGCGAAAGG	300
circopordfp	251	AAGGTGAAGT	GGTATTTTGG	CGCCCGCTGC	CACATCGAGA	AAGCGAAAGG	300
		310	320	330	340	350	
circopormank	301	AACCGACCAG	CAGAATAAAG	AATACTGCAG	TAAAGAAGGC	CACATACTTA	350
circopormeeh	301	AACCGACCAG	CAGAATAAAG	AATACTGCAG	TAAAGAAGGC	CACATACTTA	350
circopordfp	301	AACCGACCAG	CAGAATAAAG	AATACTGCAG	TAAAGAAGGC	CACATACTTA	350
		360	370	380	390	400	
circopormank	351	TCGAGTGTGG	AGCTCCGCGG	AACCGGGGA	AGCGCAGCGA	CTGTCTACT	400
circopormeeh	351	TCGAGTGTGG	AGCTCCGCGG	AACCGGGGA	AGCGCAGCGA	CTGTCTACT	400
circopordfp	351	TCGAGTGTGG	AGCTCCGCGG	AACCGGGGA	AGCGCAGCGA	CTGTCTACT	400
		410	420	430	440	450	
circopormank	401	GCTGTGAGTA	CCCTTTTGGG	GACGGGGTCT	TTGGTGACTG	TAGCCGAGCA	450
circopormeeh	401	GCTGTGAGTA	CCCTTTTGGG	GACGGGGTCT	TTGGTGACTG	TAGCCGAGCA	450
circopordfp	401	GCTGTGAGTA	CCCTTTTGGG	GACGGGGTCT	TTGGTGACTG	TAGCCGAGCA	450
		460	470	480	490	500	
circopormank	451	GTTCCTGTA	ACGTATGTGA	GAAATTTCCG	CGGGCTGGCT	GAACTTTTGA	500
circopormeeh	451	GTTCCTGTA	ACGTATGTGA	GAAATTTCCG	CGGGCTGGCT	GAACTTTTGA	500
circopordfp	451	GTTCCTGTA	ACGTATGTGA	GAAATTTCCG	CGGGCTGGCT	GAACTTTTGA	500
		510	520	530	540	550	
circopormank	501	AAGTGAGCGG	GAAGATGCAG	CAGCGTGATT	GGAAGACAGC	TGTACACGTC	550
circopormeeh	501	AAGTGAGCGG	GAAGATGCAG	CAGCGTGATT	GGAAGACAGC	TGTACACGTC	550
circopordfp	501	AAGTGAGCGG	GAAGATGCAG	CAGCGTGATT	GGAAGACAGC	TGTACACGTC	550
		560	570	580	590	600	
circopormank	551	ATAGTGGGCG	CGCCCGTTG	TGGGAAGAGC	CAGTGGGGCC	TAATTTTGGC	600
circopormeeh	551	ATAGTGGGCG	CGCCCGTTG	TGGGAAGAGC	CAGTGGGGCC	TAATTTTGGC	600
circopordfp	551	ATAGTGGGCG	CGCCCGTTG	TGGGAAGAGC	CAGTGGGGCC	TAATTTTGGC	600

FIGURE 3

circopormank circopormeeh circopordfp	601	610	620	630	640	650	
		TGAGCCTAGC	GACACCTACT	GGAAGCCTAG	TAGAAATAAG	TGGTGGGATG	650
	601	TGAGCCTAGG	GACACCTACT	GGAAGCCTAG	TAGAAATAAG	TGGTGGGATG	650
circopormank circopormeeh circopordfp	651	660	670	680	690	700	
		GATATCATGG	AGAAGAAGTT	GTGTTTTGG	GTGTTTTTA	TGGCTGGTTA	700
	651	GATATCATGG	AGAAGAAGTT	GTGTTTTGG	GTGTTTTTA	TGGCTGGTTA	700
circopormank circopormeeh circopordfp	701	710	720	730	740	750	
		CCTTGGGATG	ATCTACTGAG	ACTGTGTGAC	CGGTATCCAT	TGACTGTAGA	750
	701	CCTTGGGATG	ATCTACTGAG	ACTGTGTGAC	CGGTATCCAT	TGACTGTAGA	750
circopormank circopormeeh circopordfp	751	760	770	780	790	800	
		GACTAAAGGC	GGTACTGTTT	TTTTTTTGGC	TGGCAGTATT	TGATTACCA	800
	751	GACTAAAGGC	GGTACTGTTT	TTTTTTTGGC	TGGCAGTATT	TGATTACCA	800
circopormank circopormeeh circopordfp	801	810	820	830	840	850	
		GCAATCAGGC	CCCCCAGGAA	TGGTACTCCT	CAACTGCTGT	CCCAGCTGTA	850
	801	GCAATCAGGC	CCCCCAGGAA	TGGTACTCCT	CAACTGCTGT	CCCAGCTGTA	850
circopormank circopormeeh circopordfp	851	860	870	880	890	900	
		GAAGCTCTCT	ATCGGAGGAT	TACTACTTTG	CAATTTTGGG	AGACTGCTGG	900
	851	GAAGCTCTCT	ATCGGAGGAT	TACTACTTTG	CAATTTTGGG	AGACTGCTGG	900
circopormank circopormeeh circopordfp	901	910	920	930	940	950	
		GAACAATCA	ACGGAGGTAC	CCGAAGGCCG	TTTTGAAGCA	GTGGACCCAC	950
	901	GAACAATCC	ACGGAGGTAC	CCGAAGGCCG	TTTTGAAGCA	GTGGACCCAC	950
circopormank circopormeeh circopordfp	951	960	970	980	990	1000	
		CCTGTGCCCT	TTTCCCATAT	AAAATAAATT	ACTGAGTCTT	TTTTGTTATC	1000
	951	CCTGTGCCCT	TTTCCCATAT	AAAATAAATT	ACTGAGTCTT	TTTTGTTATC	1000
circopormank circopormeeh circopordfp	1001	1010	1020	1030	1040	1050	
		ACATCGTAAT	GGTTTTTATT	TTTATTTATT	TAGAGGGTCT	TTTAGGATAA	1050
	1001	ACATCGTAAT	GGTTTTTATT	TTTATTTATT	TAGAGGGTCT	TTTAGGATAA	1050
circopormank circopormeeh circopordfp	1051	1060	1070	1080	1090	1100	
		ATTCTCTGAA	TGTACATAA	TAGTCAGCC	TACCACATA	ATTTTGGGCT	1100
	1051	ATTCTCTGAA	TGTACATAA	TAGTCAGCC	TACCACATA	ATTTTGGGCT	1100
circopormank circopormeeh circopordfp	1101	1110	1120	1130	1140	1150	
		GTGGGTGCAT	TTGGAGCGC	TAGCCGAGG	CCTGTGTGCT	CGACATTGGT	1150
	1101	GTGGGTGCAT	TTGGAGCGC	TAGCCGAGG	CCTGTGTGCT	CGACATTGGT	1150
circopormank circopormeeh circopordfp	1151	1160	1170	1180	1190	1200	
		GTGGGTATTT	AAATGGAGCC	ACAGCTGGTT	TCTTTTATTA	TTGGGTGGA	1200
	1151	GTGGGTATTT	AAATGGAGCC	ACAGCTGGTT	TCTTTTATTA	TTGGGTGGA	1200

FIGURE 3 (continuation 1)

		1210	1220	1230	1240	1250	
circopormank	1201	ACCATCAAT	GTGTTGGTCC	AGGTCAGGTT	TGGGGGTGAA	GTACCTGGAG	1250
circopormeeh	1201	ACCAATCAAT	GTGTTGGTCC	AGGTCAGGTT	TGGGGGTGAA	GTACCTGGAG	1250
circopordfp	1201	ACCAATCAAT	GTGTTGGTCT	AGGTCAGGTT	TGGGGGTGAA	GTACCTGGAG	1250
		1260	1270	1280	1290	1300	
circopormank	1251	TGGTAGGTAA	AGGGCTGCCT	TATGGTGTGG	CGGGAGGAGT	AGTTAATATA	1300
circopormeeh	1251	TGGTAGGTAA	AGGGCTGCCT	TATGGTGTGG	CGGGAGGAGT	AGTTAATATA	1300
circopordfp	1251	TGGTAGGTAA	AGGGCTGCCT	TATGGTGTGG	CGGGAGGAGT	AGTTAATATA	1300
		1310	1320	1330	1340	1350	
circopormank	1301	GGGGTCATAG	GCCAAGTTGG	TGGAGGGGGT	TACAAAGTTG	GCATCCAAGA	1350
circopormeeh	1301	GGGGTCATAG	GCCAAGTTGG	TGGAGGGGGT	TACAAAGTTG	GCATCCAAGA	1350
circopordfp	1301	GGGGTCATAG	GCCAAGTTGG	TGGAGGGGGT	TACAAAGTTG	GCATCCAAGA	1350
		1360	1370	1380	1390	1400	
circopormank	1351	TAACAACAGT	GGACCCAACA	CCTCTTTGAT	TAGAGGTGAT	GGGGTCTCTG	1400
circopormeeh	1351	TAACAACAGT	GGACCCAACA	CCTCTTTGAT	TAGAGGTGAT	GGGGTCTCTG	1400
circopordfp	1351	TAACAACAGT	GGACCCAACA	CCTCTTTGAT	TAGAGGTGAT	GGGGTCTCTG	1400
		1410	1420	1430	1440	1450	
circopormank	1401	GGGTAATAAT	CATATTTAGC	CTTTCTAATA	CGGTAGTATT	GGAAAGGTAG	1450
circopormeeh	1401	GGGTAATAAT	CATATTTAGC	CTTTCTAATA	CGGTAGTATT	GGAAAGGTAG	1450
circopordfp	1401	GGGTAATAAT	CATATTTAGC	CTTTCTAATA	CGGTAGTATT	GGAAAGGTAG	1450
		1460	1470	1480	1490	1500	
circopormank	1451	GGGTAGGGGG	TGGTGCCCG	CTGAGGGGGG	GAGGAAGTGG	CCGATGTTGA	1500
circopormeeh	1451	GGGTAGGGGG	TGGTGCCCG	CTGAGGGGGG	GAGGAAGTGG	CCGATGTTGA	1500
circopordfp	1451	GGGTAGGGGG	TGGTGCCCG	CTGAGGGGGG	GAGGAAGTGG	CCGATGTTGA	1500
		1510	1520	1530	1540	1550	
circopormank	1501	ATCTGAGGTC	GTAAACATTC	CAAGATGGCT	CGGAGTATCC	TCCTTTTATG	1550
circopormeeh	1501	ATCTGAGGTC	GTAAACATTC	CAAGATGGCT	CGGAGTATCC	TCCTTTTATG	1550
circopordfp	1501	ATCTGAGGTC	GTAAACATTC	CAAGATGGCT	CGGAGTATCC	TCCTTTTATG	1550
		1560	1570	1580	1590	1600	
circopormank	1551	GTGATACAAA	ATTCTGTAGA	AAGGCGGGAA	TGAAGATAC	CCGTCTTTTC	1600
circopormeeh	1551	GTGATACAAA	ATTCTGTAGA	AAGGCGGGAA	TGAAGATAC	CCGTCTTTTC	1600
circopordfp	1551	GTGATACAAA	ATTCTGTAGA	AAGGCGGGAA	TGAAGATAC	CCGTCTTTTC	1600
		1610	1620	1630	1640	1650	
circopormank	1601	CGGCCATCTG	TAACGGTTTC	TGAAGGCGGG	GTGTGCCAAA	TATGGTCTTC	1650
circopormeeh	1601	CGGCCATCTG	TAACGGTTTC	TGAAGGCGGG	GTGTGCCAAA	TATGGTCTTC	1650
circopordfp	1601	CGGCCATCTG	TAACGGTTTC	TGAAGGCGGG	GTGTGCCAAA	TATGGTCTTC	1650
		1660	1670	1680	1690	1700	
circopormank	1651	TCCGGAGGAT	GTTCCTCAAGA	TGGCTGCGGG	GGCGGGTCC	TCTTCTGCGG	1700
circopormeeh	1651	TCCGGAGGAT	GTTCCTCAAGA	TGGCTGCGGG	GGCGGGTCC	TCTTCTGCGG	1700
circopordfp	1651	TCCGGAGGAT	GTTCCTCAAGA	TGGCTGCGGG	GGCGGGTCC	TCTTCTGCGG	1700
		1710	1720	1730	1740	1750	
circopormank	1701	TAACGCCCTCC	TGGCCACGT	CATCCTATAA	AGTGAAAGA	AGTGCGCTGC	1750
circopormeeh	1701	TAACGCCCTCC	TGGCCACGT	CATCCTATAA	AGTGAAAGA	AGTGCGCTGC	1750
circopordfp	1701	TAACGCCCTCC	TGGCCACGT	CATCCTATAA	AGTGAAAGA	AGTGCGCTGC	1750
		1760	1770	1780	1790	1800	
circopormank	1751	TGTAGTATT	.....	.....	.....	.....	1800
circopormeeh	1751	TGTAGTATT	.....	.....	.....	.....	1800
circopordfp	1751						

FIGURE 3 (continuation 2)

		10	20	30	40	50	
circopormank	1	MPSKKSGPQP	HKRWFVFTLNN	PSEEEKNKIR	ELPISLFDYF	VCGEEGLEEG	50
circopormeeh	1	MPSKKSGPQP	HKRWFVFTLNN	PSEEEKNKIR	ELPISLFDYF	VCGEEGLEEG	50
circopordfp[	1	MPSKKSGPQP	HKRWFVFTLNN	PSEEEKNKIR	ELPISLFDYF	VCGEEGLEEG	50
		60	70	80	90	100	
circopormank	51	RTAHLQGFAN	FAKKQTFNKV	KWYFGARCHI	EKAKGTOQQN	KEYCSKEGHI	100
circopormeeh	51	RTPHLQGFAN	FAKKQTFNKV	KWYFGARCHI	EKAKGTOQQN	KEYCSKEGHI	100
circopordfp[	51	RTPHLQGFAN	FAKKQTFNKV	KWYFGARCHI	EKAKGTOQQN	KEYCSKEGHI	100
		110	120	130	140	150	
circopormank	101	LIECGAPRNQ	GKRSOLSTAV	STLLETGSLV	TVAEQFPVTY	VRNFRGLAEL	150
circopormeeh	101	LIECGAPRNQ	GKRSOLSTAV	STLLETGSLV	TVAEQFPVTY	VRNFRGLAEL	150
circopordfp[	101	LIECGAPRNQ	GKRSOLSTAV	STLLETGSLV	TVAEQFPVTY	VRNFRGLAEL	150
		160	170	180	190	200	
circopormank	151	LKVSQKMQOR	QWKTAVHVIV	GPPGCGKSQW	ARNFAEPSOT	YWKPSRNKWTY	200
circopormeeh	151	LKVSQKMQOR	QWKTAVHVIV	GPPGCGKSQW	ARNFAEPROT	YWKPSRNKWTY	200
circopordfp[	151	LKVSQKMQOR	QWKTAVHVIV	GPPGCGKSQW	ARNFAEPROT	YWKPSRNKWTY	200
		210	220	230	240	250	
circopormank	201	OGYHGEEVVV	LODFYGWL PW	ODLLRLCORY	PLTVETKGGT	VPFLARSILI	250
circopormeeh	201	OGYHGEEVVV	LODFYGWL PW	ODLLRLCORY	PLTVETKGGT	VPFLARSILI	250
circopordfp[	201	OGYHGEEVVV	LODFYGWL PW	ODLLRLCORY	PLTVETKGGT	VPFLARSILI	250
		260	270	280	290	300	
circopormank	251	TSNQAPQEWY	SSTAVPAVEA	LYRRITTLQF	YKTAGEQSTE	VPEGRFEAVD	300
circopormeeh	251	TSNQAPQEWY	SSTAVPAVEA	LYRRITTLQF	YKTAGEQSTE	VPEGRFEAVD	300
circopordfp[	251	TSNQAPQEWY	SSTAVPAVEA	LYRRITTLQF	YKTAGEQSTE	VPEGRFEAVD	300
		310	320	330	340	350	
circopormank	301	PPCALFPYKI	NY				350
circopormeeh	301	PPCALFPYKI	NY				350
circopordfp[	301	PPCALFPYKI	NY				350

FIGURE 4



FIGURE 7  
REPLACEMENT SHEET (RULE 26)







Pro Leu Ser Ile Tyr Val Asp Asn His Pro Trp Arg Pro Thr Thr Phe Ala Phe  
 Gln Phe Val Leu Thr Cys Thr Met Thr Pro Gly Gly Pro His Pro Leu Leu Leu  
 Asn Ser Ser \*\*\* His Val Arg \*\*\* Gln Pro Ala Val Gln Thr His Tyr Phe Cys  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 TAA CCT TCT GAT TAC ATG TGC AGT AAC ACC CCG GTG GAC CCA CAC CAT TTT CGT  
 549 558 567 576 585 594  
 ATT GGA AGA CTA ATG TAC ACG TCA TIG TGG CCC CAC CTG GGT GTG GTA AAA CCA  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 Ile Gly Arg Leu Met Tyr Thr Ser Leu Trp Gly His Leu Gly Val Val Lys Ala  
 Leu Glu Asp \*\*\* Cys Thr Arg His Cys Gly Ala Thr Trp Val Trp \*\*\* Lys Gln  
 Trp Lys Thr Asn Val His Val Ile Val Gly Pro Pro Gly Cys Gly Lys Ser Lys

Pro Ser Ser Ile Lys Cys Val Arg Phe Gly Cys Val Pro Phe Trp Arg Ser Val  
 His Ala Ala Leu Lys Ala Ser Gly Ser Val Val Tyr Gln Phe Gly Gly Leu Phe  
 Ile Pro Gln \*\*\* Asn Gln Leu Gly Pro Phe Trp Met Ser Ser Val Val \*\*\* Phe  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 TTA CCC GAC GAT TAA AAC GTC TGG GCC TTT GGT GTA TGA CCT TIG GTG GAT CTT  
 603 612 621 630 639 648  
 AAT GGG CTG CTA ATT TIG CAG ACC CCG AAA CCA CAT ACT GGA AAC CAC CTA GAA  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 Asn Gly Leu Leu Ile Leu Gln Thr Arg Lys Pro His Thr Gly Asn His Leu Glu  
 Met Gly Cys \*\*\* Phe Cys Arg Pro Gly Asn His Ile Leu Glu Thr Thr \*\*\* Lys  
 Trp Ala Ala Asn Phe Ala Asp Pro Glu Thr Thr Tyr Trp Lys Pro Pro Arg Asn

Leu Pro Pro Ile Thr Val Met Thr Phe Phe His Asn Asn Asn Ile Val Lys Ile  
 Leu His His Ser Pro \*\*\* Trp Pro Ser Ser Thr Thr Thr Thr Ser Ser Lys \*\*\*  
 Cys Thr Thr Pro His Asn Gly His His Leu Leu Pro Gln \*\*\* Gln His Ser Lys  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 TGT TCA CCA CCC TAC CAA TGG TAC CAC TTC TTC ACC AAC AAT AAC TAC TGA AAA  
 657 666 675 684 693 702  
 ACA AGT GGT GGG ATG GTT ACC ATG GTG AAG AAG TGG TTG TTA TTG ATG ACT TTT  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 Thr Ser Gly Gly Met Val Thr Met Val Lys Lys Trp Leu Leu Leu Met Thr Phe  
 Gln Val Val Gly Trp Leu Pro Trp \*\*\* Arg Ser Gly Cys Tyr \*\*\* \*\*\* Leu Leu  
 Lys Trp Trp Asp Gly Tyr His Gly Glu Glu Val Val Val Ile Asp Asp Phe Tyr

Ala Pro Gln Gly Pro Ile Ile \*\*\* Gln Ser Gln Thr Ile Ser Ile Trp Gln Ser  
 Pro Gln Ser Gly Gln Ser Ser Arg Ser Leu Ser His Ser Arg Tyr Gly Asn Val  
 His Ser Ala Ala Arg Pro His Asp Val Ser Val Thr His Asp Ile Asp Met Ser  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 TAC CGA CCG ACG GGA CCC TAC TAG ATG ACT CTG ACA CAC TAG CTA TAG GTA ACT  
 711 720 729 738 747 756  
 ATG GCT GGC TGC CCT GGG ATG ATC TAC TGA GAC TGT GTG ATC GAT ATC CAT TGA  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 Met Ala Gly Cys Pro Gly Met Ile Tyr \*\*\* Asp Cys Val Ile Asp Ile His \*\*\*  
 Trp Leu Ala Ala Leu Gly \*\*\* Ser Thr Glu Thr Val \*\*\* Ser Ile Ser Ile Asp  
 Gly Trp Leu Pro Trp Asp Asp Leu Leu Arg Leu Cys Asp Arg Tyr Pro Leu Thr

Tyr Leu Ser Phe Thr Ser Ser Tyr Arg Lys Gln Gly Ala Thr Asn Gln Asn Gly  
 Thr Ser Val Leu Pro Pro Val Thr Gly Lys Lys Ala Arg Leu Ile Arg Ile Val  
 Gln Leu Ser \*\*\* Leu His Phe Gln Val Lys Lys Pro Gly Cys Tyr Glu Ser \*\*\*  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 GAC ATC TCT GAT TTC CAC CTT GAC ATG GAA AAA ACC GGG CGT CAT AAG ACT AAT  
 765 774 783 792 801 810  
 CTG TAG AGA CTA AAG GTG GAA CTG TAC CTT TTT TGG CCC GCA GTA TTC TGA TTA  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 Leu \*\*\* Arg Leu Lys Val Glu Leu Tyr Leu Phe Trp Pro Ala Val Phe \*\*\* Leu  
 Cys Arg Asp \*\*\* Arg Trp Asn Cys Thr Phe Phe Gly Pro Gln Tyr Ser Asp Tyr  
 Val Glu Thr Lys Gly Gly Thr Val Pro Phe Leu Ala Arg Ser Ile Leu Ile Thr

FIGURE 8 (continuation 2)

Ala Ile Leu Gly Arg Gln Phe Pro Val Gly \*\*\* Ser Ser Asp Trp Ser Tyr Phe  
 Leu Leu \*\*\* Val Gly Asn Ser His Tyr Glu Glu Val Ala Thr Gly Ala Thr Ser  
 Trp Cys Asp Ser Gly Thr Pro Ile Thr Ser Arg Leu Gln Gln Gly Leu Gln Leu  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 GGT CGT TAG TCT GGG GCA ACC TTA CCA TGA GGA GTT GAC GAC AGG GTC GAC ATC  
 819 828 837 846 855 864  
 CCA GCA ATC AGA CCC CGT TGG AAT GGT ACT CCT CAA CTG CTG TCC CAG CTG TAG  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 Pro Ala Ile Arg Pro Arg Trp Asn Gly Thr Pro Gln Leu Leu Ser Gln Leu \*\*\*  
 Gln Gln Ser Asp Pro Val Gly Met Val Leu Leu Asn Cys Cys Pro Ser Cys Arg  
 Ser Asn Gln Thr Pro Leu Glu Trp Tyr Ser Ser Thr Ala Val Pro Ala Val Glu

Ser Lys Ile Pro Pro Asn Ser Gly Gln Tyr Lys Pro Leu Ile Ser Cys Phe Leu  
 Ala Arg \*\*\* Arg Leu Ile Val Glu Lys Thr Asn Gln Phe Phe Ala Val Ser Cys  
 Leu Glu Lys Asp Ser Ser \*\*\* Lys Arg Pro Ile Lys Ser Ser His \*\*\* Leu Val  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 TTC GAG AAA TAG CCT CCT AAT GAA GGA ACC ATA AAA CCT TCT TAC GAT GTC TTG  
 873 882 891 900 909 918  
 AAG CTC TTT ATC GGA GGA TTA CTT CCT TGG TAT TTT GGA AGA ATG CTA CAG AAC  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 Lys Leu Phe Ile Gly Gly Leu Leu Pro Trp Tyr Phe Gly Arg Met Leu Gln Asn  
 Ser Ser Leu Ser Glu Asp Tyr Phe Leu Gly Ile Leu Glu Glu Cys Tyr Arg Thr  
 Ala Leu Tyr Arg Arg Ile Thr Ser Leu Val Phe Trp Lys Asn Ala Thr Glu Gln

Gly Arg Leu Phe Pro Ala Leu Glu Asp Gly Lys Gly Gly Trp Ala Arg Phe Lys  
 Asp Val Ser Ser Pro Pro Trp Asn Thr Val Arg Glu Gly Gly His Gly Ser Asn  
 Ile Trp Pro Pro Leu Pro Gly Thr Arg \*\*\* Gly Lys Gly Gly Met Gly Gln Ile  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 TTA GGT CCC TCC TTC CCC CGG TCA AGG AGT GGG AAA GGG GGG GTA CCG GAC TTA  
 927 936 945 954 963 972  
 AAT CCA CGG AGG AAG GGG GCC AGT TCG TCA CCC TTT CCC CCC CAT GCC CTG AAT  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 Asn Pro Arg Arg Lys Gly Ala Ser Ser Ser Pro Phe Pro Pro His Ala Leu Asn  
 Ile His Gly Gly Arg Gly Pro Val Arg His Pro Phe Pro Pro Met Pro \*\*\* Ile  
 Ser Thr Glu Glu Gly Gly Gln Phe Val Thr Leu Ser Pro Pro Cys Pro Glu Phe

Trp Ile Phe Tyr Ile Val Ser Asp Lys Lys Asp Ser Arg Leu Pro Lys \*\*\* \*\*\*  
 Gly Tyr Ser Ile Phe \*\*\* Gln Thr Lys Lys Ile Val Glu Tyr His Asn Lys Asn  
 Glu Met His Phe Leu Asn Ser Leu Arg Lys \*\*\* \*\*\* Lys Thr Ile Thr Lys Ile  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 AAG GTA TAC TTT ATT TAA TGA CTC AGA AAA AAT AGT GAA GCA TTA CCA AAA ATA  
 981 990 999 1008 1017 1026  
 TTC CAT ATG AAA TAA ATT ACT GAG TCT TTT TTA TCA CTT CGT AAT GGT TTT TAT  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 Phe His Met Lys \*\*\* Ile Thr Glu Ser Phe Leu Ser Leu Arg Asn Gly Phe Tyr  
 Ser Ile \*\*\* Asn Lys Leu Leu Ser Leu Phe Tyr His Phe Val Met Val Phe Ile  
 Pro Tyr Glu Ile Asn Tyr \*\*\* Val Phe Phe Ile Thr Ser \*\*\* Trp Phe Leu Leu

Glu Asn Leu Thr Leu His Pro Thr Lys Leu Ile Leu Asn Glu Ser Asn Tyr Met  
 Asn Met Leu Pro \*\*\* Thr Pro Pro Arg \*\*\* Phe \*\*\* Ile Arg Gln Ile Thr Cys  
 Ile \*\*\* \*\*\* Pro Asn Leu Pro Pro Asp Lys Phe Asn Phe Glu Arg Phe Gln Val  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 ATA AGT AAT TCC CAA TTC ACC CCC CAG AAA TTT TAA TTT AAG AGA CTT AAC ATG  
 1035 1044 1053 1062 1071 1080  
 TAT TCA TTA AGG GTT AAG TGG GGG GTC TTT AAA ATT AAA TTC TCT GAA TTG TAC  
 --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---  
 Tyr Ser Leu Arg Val Lys Trp Gly Val Phe Lys Ile Lys Phe Ser Glu Leu Tyr  
 Ile His \*\*\* Gly Leu Ser Gly Gly Ser Leu Lys Leu Asn Ser Leu Asn Cys Thr  
 Phe Ile Lys Gly \*\*\* Val Gly Gly Leu \*\*\* Asn \*\*\* Ile Leu \*\*\* Ile Val His

FIGURE 8 (continuation 3)

Cys Pro \*\*\* Val Ser Ile Thr Asn Arg Thr Thr Tyr Val Thr Lys Ser Arg Leu  
 Val His Asn Cys Pro Tyr Gln Ile Gly Pro Arg Ile Tyr Gln Lys Arg Val Cys  
 Tyr Met Thr Val Arg Ile Asn Tyr Glu Gln Asp Tyr Ile Ser Asn Glu Phe Ala  
 ---  
 TAT GTA CCA ATG TGC CTA TAA CAT AAG GAC CAG CAT ATA TGA CAA AAG CTT CCG  
 1089 1098 1107 1116 1125 1134  
 ATA CAT GGT TAC ACG GAT ATT GTA TTC CTG GTC GTA TAT ACT GTT TTC GAA CCG  
 ---  
 Ile His Gly Tyr Thr Asp Ile Val Phe Leu Val Val Tyr Thr Val Phe Glu Arg  
 Tyr Met Val Thr Arg Ile Leu Tyr Ser Trp Ser Tyr Ile Leu Phe Ser Asn Ala  
 Thr Trp Leu His Gly Tyr Cys Ile Pro Gly Arg Ile Tyr Cys Phe Arg Thr Gln  
 ---  
 Ala Ser Ala \*\*\* Thr Thr \*\*\* Met Glu Leu Leu Lys Tyr Asp \*\*\* Gly Cys Ser  
 His Arg Pro Arg Arg Pro Arg Cys Lys Trp Cys Asn Thr Thr Glu Ala Val Ala  
 Thr Gly Leu Gly Val His Asp Val Asn Gly Ala Thr Gln Leu Arg Leu Trp Leu  
 ---  
 TCA CCG CTC CCG ATG CAC CAG ATG TAA AGG TCG TCA AAC ATC ACA GTC GGT GTC  
 1143 1152 1161 1170 1179 1188  
 AGT CCC GAG GCC TAC GTG GTC TAC ATT TCC AGC AGT TTG TAG TCT CAG CCA CAG  
 ---  
 Ser Ala Glu Ala Tyr Val Val Tyr Ile Ser Ser Ser Leu \*\*\* Ser Gln Pro Gln  
 Val Pro Arg Pro Thr Trp Ser Thr Phe Pro Ala Val Cys Ser Leu Ser His Ser  
 Cys Arg Gly Leu Arg Gly Leu His Phe Gln Gln Phe Val Val Ser Ala Thr Ala  
 ---  
 Thr Glu Lys Thr Thr Gln Asn Ser Thr Ile Leu Leu Ser Ile \*\*\* Ser Leu Asn  
 Pro Lys Lys Gln Gln Lys Thr Pro Leu Leu \*\*\* Tyr His Phe Arg Pro Cys Thr  
 Gln Asn Arg Lys Asn Asn Pro Gln Phe Tyr Asp Ile Thr Phe Asp Leu Val Pro  
 ---  
 GAC CAA AGA AAA CAA CAA ACC AAC CTT CAT TAG TTA TCA CTT TAG ATC CTG TCC  
 1197 1206 1215 1224 1233 1242  
 CTG GTT TCT TTT GTT GTT TGG TTG GAA GTA ATC AAT AGT GAA ATC TAG GAC AGG  
 ---  
 Leu Val Ser Phe Val Val Trp Leu Glu Val Ile Asn Ser Glu Ile \*\*\* Asp Arg  
 Trp Phe Leu Leu Leu Phe Gly Trp Lys \*\*\* Ser Ile Val Lys Ser Arg Thr Gly  
 Gly Phe Phe Cys Cys Leu Val Gly Ser Asn Gln \*\*\* Asn Leu Gly Gln Val  
 ---  
 Pro Pro Leu Thr Gly Pro Thr Thr Pro Ser Pro Ser Pro \*\*\* Pro Ile Ala Pro  
 Gln Pro Tyr Leu Val Pro Leu Pro Leu Leu Leu Ala Pro Asn His Tyr Pro Pro  
 Lys Pro Thr Phe Tyr Arg Ser His Tyr Ser Phe Pro Gln Thr Ile Thr His Arg  
 ---  
 AAA CCC CCA TTT CAT GGC CCT CAC CAT CCT CTT CCC GAC CCA ATA CCA TAC CCG  
 1251 1260 1269 1278 1287 1296  
 TTT GGG GGT AAA GTA CCG GGA GTG GTA GGA GAA GCG CTG GGT TAT GGT ATG CCG  
 ---  
 Phe Gly Gly Lys Val Pro Gly Val Val Gly Glu Gly Leu Gly Tyr Gly Met Ala  
 Leu Gly Val Lys Tyr Arg Glu Trp \*\*\* Glu Lys Gly Trp Val Met Val Trp Arg  
 Trp Gly \*\*\* Ser Thr Gly Ser Gly Arg Arg Arg Ala Gly Leu Trp Tyr Gly Gly  
 ---  
 Pro Thr Thr \*\*\* Met Pro Thr Met Pro Ser Pro Gln Pro Arg Gln \*\*\* Leu Thr  
 Leu Leu Lys Cys Leu Pro \*\*\* Leu His Pro Ser His Gly Lys Asn Cys Leu  
 Ser Ser Tyr Asn Val Tyr Pro Asp Tyr Thr Leu Ala Thr Ala Lys Thr Val Phe  
 ---  
 CCT CCT CAT CAA ATG TAT CCC CAG TAT CCA CTC CCG ACA CCG GAA ACA ATG TTT  
 1305 1314 1323 1332 1341 1350  
 GGA GGA GTA GTT TAC ATA GGG GTC ATA GGT GAG GCG TGT GCG CTT TGT TAC AAA  
 ---  
 Gly Gly Val Val Tyr Ile Gly Val Ile Gly Glu Gly Cys Gly Leu Cys Tyr Lys  
 Glu Glu \*\*\* Phe Thr \*\*\* Gly Ser \*\*\* Val Arg Ala Val Ala Phe Val Thr Lys  
 Arg Ser Ser Leu His Arg Gly His Arg \*\*\* Gly Leu Trp Pro Leu Leu Gln Ser

FIGURE 8 (continuation 4)

Ile Met \*\*\* Phe Leu Leu Val Pro Ala Trp Glu Gly Thr Val Arg Pro Ser Arg  
 \*\*\* Arg Phe Tyr Cys Cys Gln Leu Gly Ser Gly Gln \*\*\* Gly Pro His Asp  
 Asn Asp Asp Leu Ile Val Ala Ser Ser Gly Val Gly Arg Asp Gly Gln Thr Ile  
 ---  
 CAA TAG TAG ATT TTA TTG TCG TGA CCT CGG GTG AGG OGA CAG TCG GAC CCA CTA  
 1359 1368 1377 1386 1395 1404  
 GTT ATC ATC TAA AAT AAC AOC ACT GGA GCC CAC TCC CCT GTC ACC CTG GGT GAT  
 ---  
 Val Ile Ile \*\*\* Asn Asn Ser Thr Gly Ala His Ser Pro Val Thr Leu Gly Asp  
 Leu Ser Ser Lys Ile Thr Ala Leu Glu Pro Thr Pro Leu Ser Pro Trp Val Ile  
 Tyr His Leu Lys \*\*\* Gln His Trp Ser Pro Leu Pro Cys His Pro Gly \*\*\* Ser

Pro Ala Pro Gly Ser Asn Leu Arg Leu Arg Glu \*\*\* Glu Thr Thr Asn Leu Pro  
 Pro Leu Leu Ala Leu Ile \*\*\* Gly \*\*\* Gly Lys Lys Asn Gln Leu Ile \*\*\* Leu  
 Pro Ser Cys Pro Trp Phe Glu Val Lys Val Lys Arg Ile Arg Tyr Tyr Glu Phe  
 ---  
 GCC CCT CGT CCC GGT CTT AAG TTG GAA TTG GAA AGA ATA AGA CAT CAT AAG TTT  
 1413 1422 1431 1440 1449 1458  
 COG GGA GCA GGG CCA GAA TTC AAC CTT AAC CTT TCT TAT TCT GTA GTA TTC AAA  
 ---  
 Arg Gly Ala Gly Pro Glu Phe Asn Leu Asn Leu Ser Tyr Ser Val Val Phe Lys  
 Gly Glu Gln Gly Gln Asn Ser Thr Leu Thr Phe Leu Ile Leu \*\*\* Tyr Ser Lys  
 Gly Ser Arg Ala Arg Ile Gln Pro \*\*\* Pro Phe Leu Phe Cys Ser Ile Gln Arg

Cys Leu Ala Pro Thr Gln Gly Gly Glu Gln Pro Phe Phe Thr Met Leu Ile Ser  
 Ala Cys Leu Pro Pro Lys Val Gly Arg Arg Pro Ser Ser Leu \*\*\* Tyr Gln  
 Pro Val Ser Arg Pro Asn Ser Gly Gly Gly Pro Pro Leu Phe Asp Asn Ile Asn  
 ---  
 CCC GTG TCT CCC CCC CAA ACT GCG GCG AGG ACC CCC TTC TTT CAG TAA TTA TAA  
 1467 1476 1485 1494 1503 1512  
 GCG CAC AGA GCG GCG GTT TGA CCC CCC TCC TCG GCG AAG AAA GTC ATT AAT ATT  
 ---  
 Gly His Arg Ala Gly Val \*\*\* Pro Pro Ser Trp Gly Lys Lys Val Ile Asn Ile  
 Gly Thr Glu Arg Gly Phe Asp Pro Pro Pro Gly Gly Arg Lys Ser Leu Ile Leu  
 Ala Gln Ser Gly Gly Leu Thr Pro Leu Leu Gly Glu Glu Ser His \*\*\* Tyr \*\*\*

Asp \*\*\* Thr Trp Arg Gly Pro Pro Arg Glu Ser Gln Pro Glu Ser Ser Leu  
 Ile Glu Asp His Gly Gly Gly Leu Leu Ala Asn Gln Ser His Asn Ala Gln Cys  
 Phe Arg Met Met Asp Val Ala Trp Ser Pro Thr Arg Val Thr Thr Arg Lys Val  
 ---  
 CTT AGA GTA GTA CAG GTG GCG GGT CCT CCC GCA AGA CTG ACA CCA AGC GAA CTG  
 1521 1530 1539 1548 1557 1566  
 GAA TCT CAT CAT GTC CAC CGC CCA GGA GCG CGT TCT GAC TGT GGT TCG CTT GAC  
 ---  
 Glu Ser His His Val His Arg Pro Gly Gly Arg Ser Asp Cys Gly Ser Leu Asp  
 Asn Leu Ile Met Ser Thr Ala Gln Glu Gly Val Leu Thr Val Val Arg Leu Thr  
 Ile Ser Ser Cys Pro Pro Pro Arg Arg Ala Phe \*\*\* Leu Trp Phe Ala \*\*\* Gln

Ile Asp Ser Pro Ala Pro Ser Ala Pro Thr Ser Ser Ala Met Lys Gly Glu Gly  
 Tyr Ile Arg Leu His Pro Leu Pro Pro His Gln Leu His Trp Lys Glu Lys Glu  
 Thr Tyr Gly Phe Thr Arg Ser Leu Arg Thr Asn Phe Ile Gly Asn Lys Arg Arg  
 ---  
 TCA TAT AGG CTT CCA CGC CCT CTC CGC CCA CAA CTT CTA CGG TAA AAA GGA AGA  
 1575 1584 1593 1602 1611 1620  
 AGT ATA TCC GAA GGT GCG GGA GAG GCG GGT GTT GAA GAT GCC ATT TTT CCT TCT  
 ---  
 Ser Ile Ser Glu Gly Ala Gly Glu Ala Gly Val Glu Asp Ala Ile Phe Pro Ser  
 Val Tyr Pro Lys Val Arg Glu Arg Arg Val Leu Lys Met Pro Phe Phe Leu Leu  
 Tyr Ile Arg Arg Cys Gly Arg Gly Gly Cys \*\*\* Arg Cys His Phe Ser Phe Ser

FIGURE 8 (continuation 5)



DMG in grams

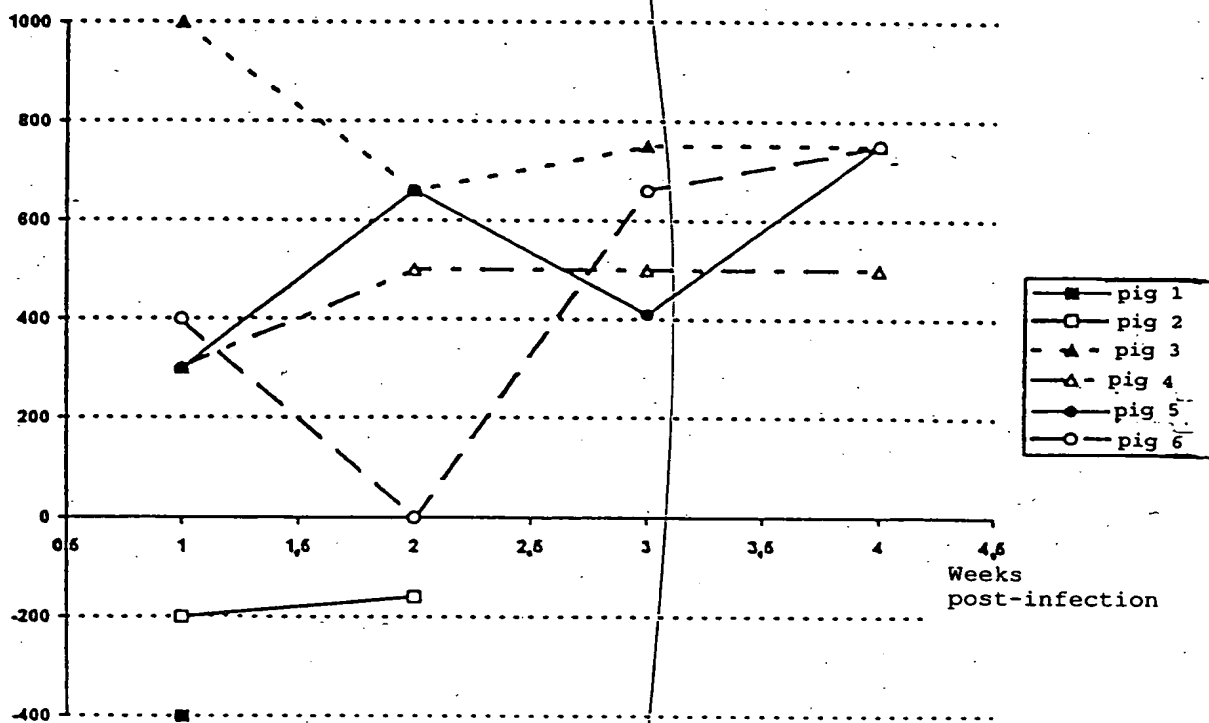
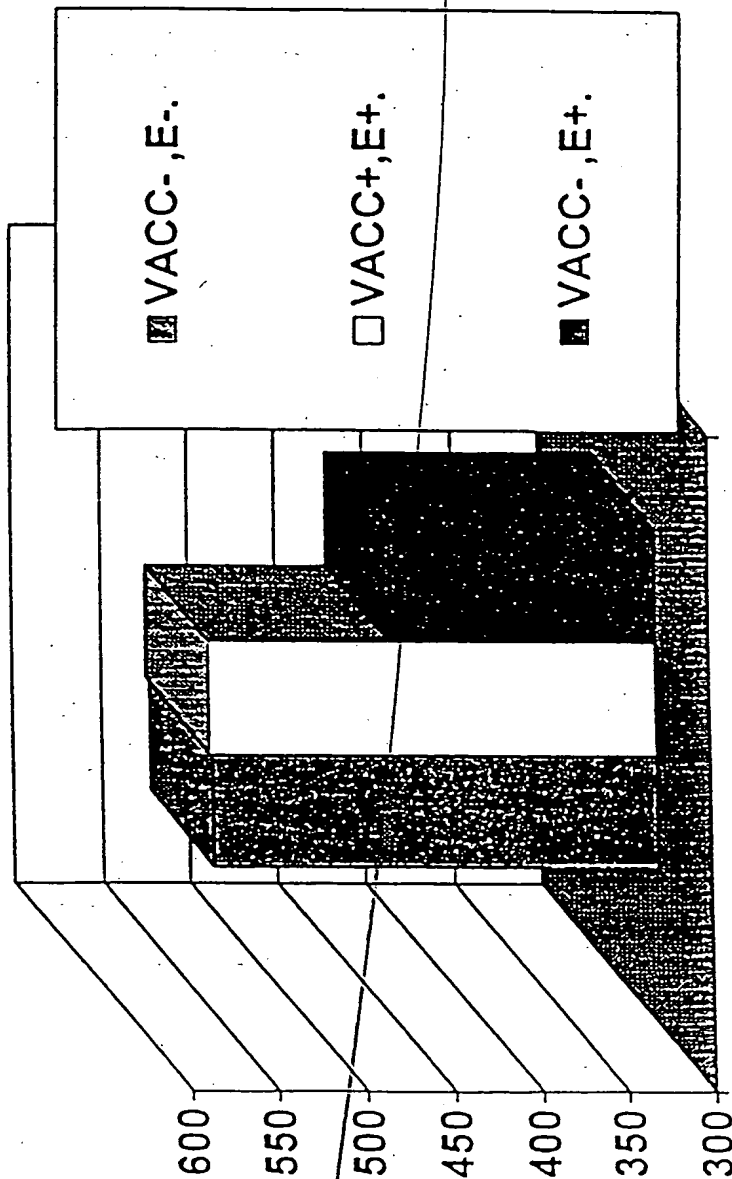


FIGURE 9

dmg: d0 - d28



d0 - d28

FIGURE 10

% HYPERTHERMIA > 41°C

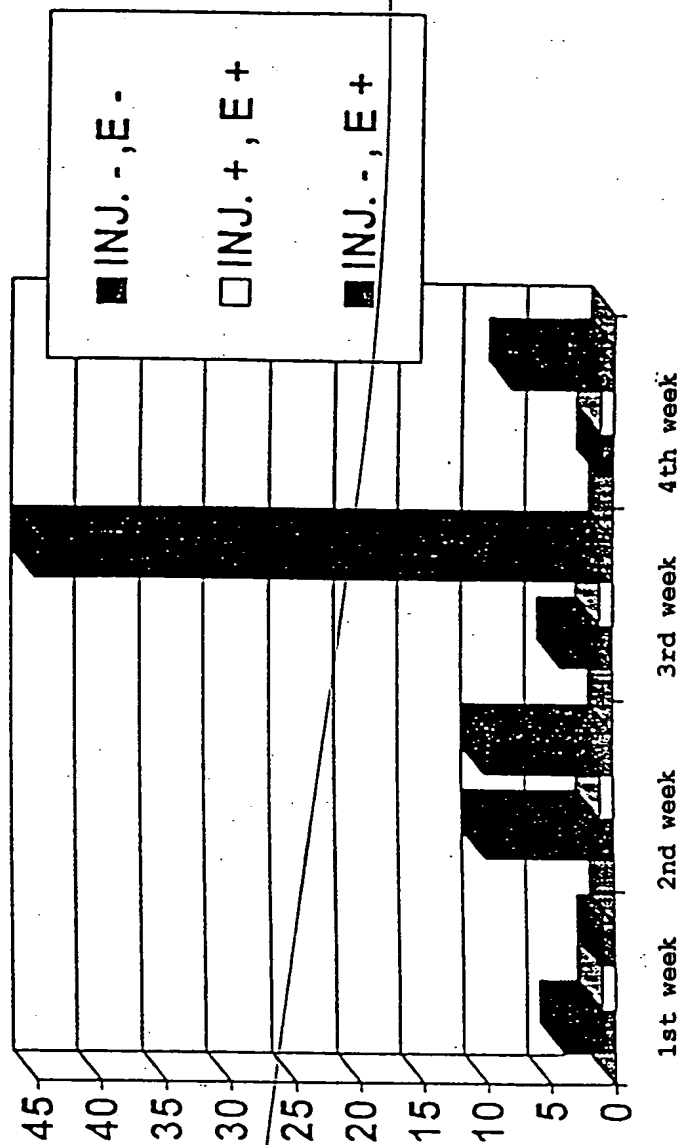


FIGURE 11



000000" 04247550

Type B  
spot No. 104 to 159

Type A  
spot No. 160 to 215

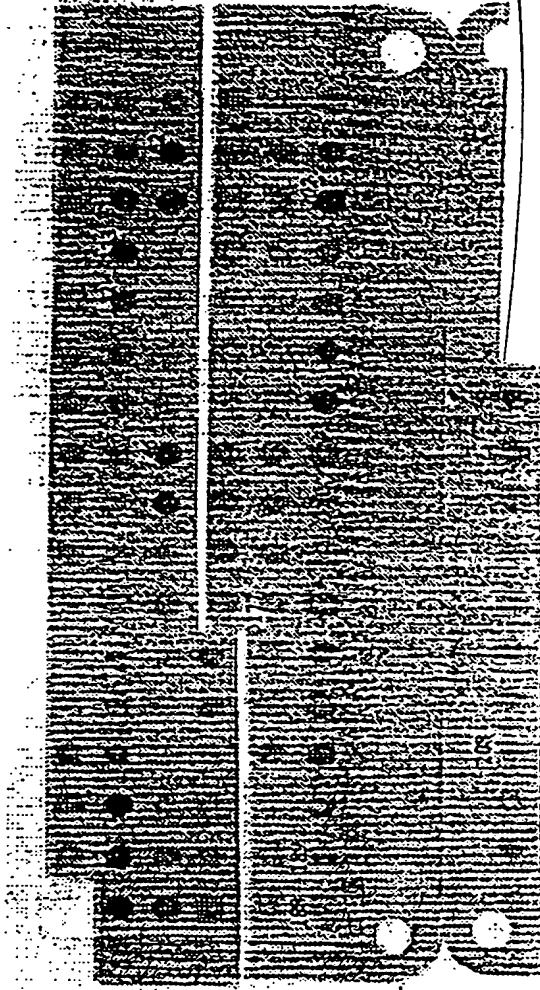


FIGURE 12

1 MTWPRRRYRR RRTPRSHLG NILRRRPYLV HPAFRNRYRW RRKTGIENSR LSREFLT. RGGHSQPSWN  
pcvA  
MTYPRRRYRR RRRPRSHLG QILRRRPWL V HP. RHRYRW RRKNGIENR LSRTGYTVK RTTVRTPSWA  
pcvB

	peptide 177	100	101	peptides 188 to 189
pcvA	VNELRENIGQ FLPPSGGTNP	LPLFQYYRI	RKAKYEFYPR	DPITSNQGV GSTVILDAN
pcvB	VMMRENIND FLPPGGGSNP	RSVPFEYYRI	RKVKVEFWPC	SPITQDGRGV GSSAVILDDN
				FVTPSTNLAY FVTKATALTY

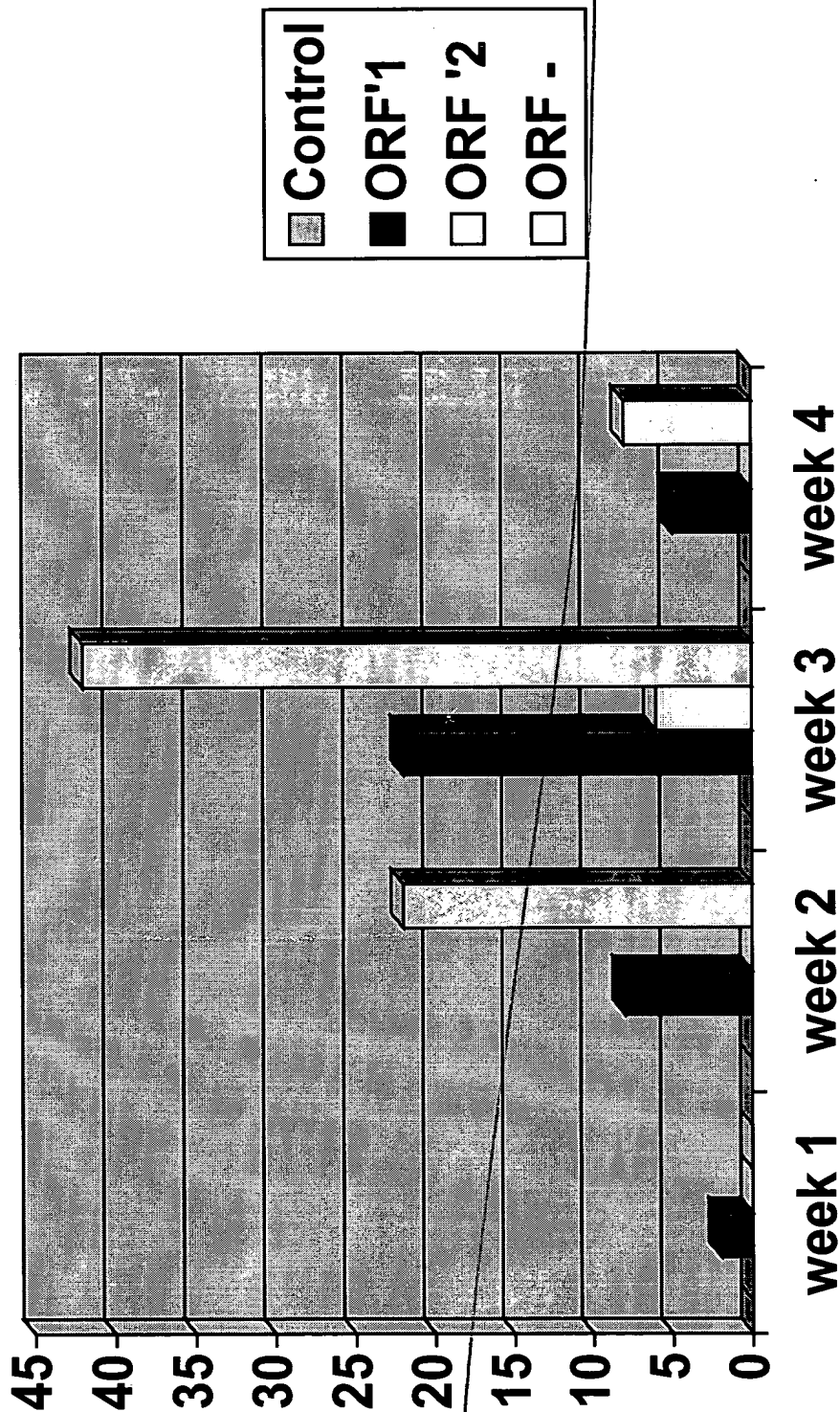
peptide 121		peptides 132 to 133	
150	151	<i>peptide 208</i>	
pcvA	DPYINYSSRH TIRQPFYHS RYFTPKPELD QTIDWEQPNN KRNQLWLHLN THTNVEHTGL GYALQNATTA		
pcvB	DPVNYSSRH TITQPFYHS RYFTPKPULD FTIDYFQPNN--KRNQLWLRLQ TAGNVDHVGL GTAFENSIYD		

peptide 152

pcvA QNYVRLTIY VQFREFIKLD P.LNE  
pcvB QEYNIRVTMY VQFREFEKFD PPLNP

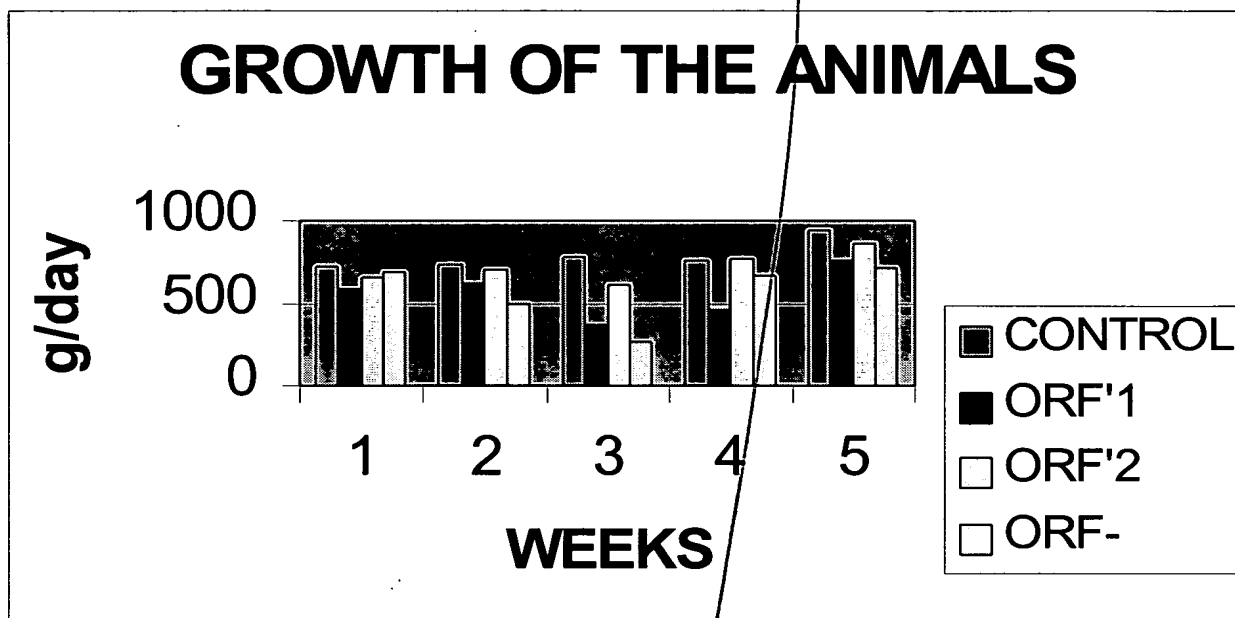
**FIGURE 13**

Figure 14



Percent hyperthermia ( $> 40.5^{\circ}\text{C}$ ), Control (not vaccinated and not challenged), ORF'1 (vaccinated and challenged), ORF'2 (vaccinated and challenged), ORF- (not vaccinated, challenged)

**Figure 15**



Control (not vaccinated and not challenged), ORF'1(vaccinated and challenged) ORF'2 (vaccinated and challenged), ORF- (not vaccinated, challenged)

## Figure 16

Immunoperoxidase staining of PK15 cells at 24 h post-transfection with the pcDNA3/ORF'2 plasmid. Expression of PCV-B ORF'2 was confirmed by IPMA following incubation in the presence of the swine anti-PCV-B monospecific serum.

